

December 23, 2013

EDI Job Number: 13-Y-0167

Assessment and Abandoned Mines Branch (AAM) K-149
Department of Energy, Mines and Resources, Yukon Government
Room 2C Royal Center, 4114-4th Avenue
PO 2703, Whitehorse, YT, Y1A 2C6

Attention: Adrienne Turcotte, Mount Nansen Project Officer

Re: Mount Nansen Surface Water Quality Field Memo: December 16-18, 2013

Trip Dates:	December 16-18, 2013
EDI Field Staff:	Dawn Hansen and Joel MacFabe
Tasks:	Hydrology and Water Quality

Field Summary

EDI completed the surface water quality sampling and hydrometric monitoring at the Mount Nansen Site from December 16 to December 18, 2013. Air temperatures during the trip ranged from -29°C to -37°C. Weather conditions were clear with occasional light winds. All streams and water bodies had some ice cover. Ice thickness was variable depending on the location and ranged from 5 cm to 88 cm. Some sampling sites still have open leads with ice along the margins of the stream. There was between 15 cm and 40 cm of snow on the ground during the site visit. Water levels across most of the sites/stations were low to moderate, however four creeks were frozen to substrate.

Each section below details additional site- and station-specific information for the Hydrology (Section 1) and Water Quality (Section 2) programs. Included in the Water Quality section are appendices of water quality parameters that exceeded guidelines and/or the Mount Nansen Effluent Quality Standards, ALS Lab Analysis Reports, and YG Environmental Health Services bacteriological analysis results for the previous trip (November 12-14, 2013) (Appendix A , B, C). Section 3 contains relevant photos of field conditions. Section 4 details additional monitoring program comments, noteworthy observations, and any changes to budget or scope moving forward. A map of water quality site and hydrometric stations is provided in Appendix D.



1. Hydrology

All hydrometric stations were visited and station conditions documented, excluding sites that were frozen to substrate on the last trip. Stream discharge measurements were collected at each hydrometric station that was not frozen or dry using the volumetric method, and/or the salt tracer method using a salt slug injection. The cross-sectional velocity-area method (*i.e.* mid-section method) was not used during this trip due to thick ice conditions and extremely cold weather which prevented equipment from working.

Water levels at all stations were typical of the mid-winter period, with discharges ranging from low to moderate. In general, ice thickness ranged from less than 5 cm to 88 cm across the Mount Nansen Site. Table 1 summarizes the hydrometric monitoring program measurements completed at each station and any additional relevant station details.

Table 1. Hydrometric program details.

Hydrology program dates:	December 16-17, 2013	
Weather at time of monitoring:	Weather conditions were typically clear and calm, with temperatures between -29°C to -37°C.	
Station	Hydrometric Measurement Type	Notes & Comments
ATM-DC2/DC4	None	Both atmospheric barologgers were downloaded.
H-DC-DX	None	No hydrometric measurement taken, site frozen to substrate.
H-DC-DX+105	Salt slug	Water levels moderate. Salt tracer method used to measure stream discharge. Ice cover on most of channel and shore ice along channel where it was open. All ice was snow covered.
H-DC-D1b	None	No hydrometric measurement taken, site frozen to substrate.
H-DC-U1	None	No hydrometric measurement taken, site frozen to substrate.
H-DC-U2	None	No hydrometric measurement taken, site frozen to substrate.
H-DC-B	None	No hydrometric measurement taken. There was flow in the channel, however the crew noted an excavator dredging upstream which prevented sampling from occurring during this visit (Photo 1).
H-DC-M	Salt Slug	Water level low, channel snow and ice (12 cm thick) covered. Salt tracer used to estimate stream discharge. Logger downloaded.
H-DC-R	None	Overflow ice and thick ice conditions were not conducive for hydrometric sampling (Photo 2 & Photo 3). The flow is no longer channelized. No hydrometric measurement taken, site considered frozen to substrate.
H-VC-REF	Salt Slug	Flow levels low and water clear. Salt tracer used to estimate stream discharge. Channel snow and ice covered.
H-VC-U	Salt Slug	Water level moderate and clear. Discharge measurement completed using salt tracer. Logger downloaded. Ice cover on majority of the channel, however there are still open leads (Photo



Station	Hydrometric Measurement Type	Notes & Comments
		4).
H-BC	None	Frozen to substrate.
H-VC-DBC	Salt Slug	Water level moderate and water was clear. Salt tracer was the primary method used to measure discharge. The logger was downloaded. Channel is snow and ice covered (ice was < 5 cm thick).
H-VC-UMN	Salt Slug	Salt tracer used to measure discharge. Water level was moderate and turbidity was clear. Channel snow and ice covered with an open lead upstream of the well site.
H-MN	None	No hydrometric measurement taken. Two holes were made, one reaching dry ground and the other resulting in a pocket of water with no flow. Site considered frozen to substrate.
H-VC-R	Salt Slug	Water level low and water relatively clear. Salt tracer used to estimate discharge. Logger downloaded. Channel snow and ice covered with small open leads in thalweg. Lots of overflow has developed resulting in ice 88 cm thick near the well site (Photo 5).
H-SEEP	Volumetric	A volumetric measurement was made at the pipe discharge. Flow rate and total volume was recorded from the flow meter. No staff gauge reading taken due to ice cover.
H-TP	None	Note full ice coverage at time of sampling. No staff gauge reading taken due to ice cover.
H-PC-U	None	No hydrometric measurement taken, site frozen to substrate.
H-PC-DSP	None	No hydrometric measurement taken, site frozen to substrate.

2. Water Quality

Water quality samples were collected from all monitoring sites with the exception of those that were either dry or had unsuitable conditions for sampling and were considered frozen to substrate. Water levels were moderate to low at all sites, with most creek sites having ice cover across the channel with the exception of open leads. Table 2 summarizes the water quality sampling conditions at each site.

All water quality samples were delivered to ALS on Wednesday, December 18, 2013. Bacteriological samples collected from the pump house well were submitted to YG Environmental Health Services (EHS) on Wednesday, December 18, 2013.

This memo includes analytical results from samples collected during the November 12-14, 2013 trip (Appendix A, C) as well as copies of the ALS Certificate of Analysis (Appendix B).



Table 2. Water quality sampling program details.

WQ Sampling dates:	December 16-18, 2013
Weather at time of sampling:	Weather conditions were typically clear and calm. Period gusts of wind occurred throughout the sampling event and temperatures between -29°C to -37°C.

Site	Sampled? (Yes/No)	Notes / Explanations
WQ-PIT1	Yes	Samples taken from just below the ice. Water level was a total depth of 7 meters.
WQ-PIT2	Yes	Samples taken from 3 m depth.
WQ-PIT3	Yes	Samples taken from 6 m depth.
WQ-SEEP	Yes	Conditions normal for this time of year. Ice build-up around pipe and barrel at the site.
WQ-TP	Yes	Ice thickness 60 cm.
WQ-DC-DX	No	No water samples taken, site frozen to substrate.
WQ-DC-DX+105	Yes	Water levels were moderate.
WQ-DC-D1b	No	No water samples taken, site frozen to substrate.
WQ-DC-U1	No	No water samples taken, site frozen to substrate.
WQ-DC-U2	No	No water samples taken, site frozen to substrate.
WQ-DC-U	Yes	Water levels were low. Sample collected at regular location. Ice cover over whole channel (Photo 8).
WQ-DC-R	No	No water samples taken, site frozen to substrate. Multiple layers of ice with small amount of water between.
WQ-VC-REF	Yes	Water levels were low. Whole site ice covered. Ice in layers (30 cm total).
WQ-VC-U	Yes	Water levels were low. Area of open water just below sample site. Sample collected at regular location.
WQ-BC	No	No water samples taken, site frozen to substrate.
WQ-VC-DBC	Yes	Water levels were low. Sample taken from regular sample location.
WQ-VC-UMN	Yes	Water levels were low. Water quality samples were collected within an open water section at the regular sampling location (Photo 7).
WQ-MN	No	Water quality samples were not taken due to unsuitable conditions (No flow, pocket of standing water observed (Photo 6). Site frozen to substrate.
WQ-VC-R	Yes	Water levels were low. No open water, however overflow was observed upstream of culvert at typical sampling location. Samples were collected at regular winter sampling site approximately 150 m downstream of culvert. Ice at sample site was approximately 30 cm thick.
WQ-PW	Yes	Bacteriological sample and drinking water samples collected from discharge pipe.
WQ-PC-U	No	No water samples taken, site frozen to substrate.
WQ-PC-D	No	No water samples taken, site frozen to substrate.



Site	Sampled? (Yes/No)	Notes / Explanations
WQ-ADIT-SEEP	No	No water samples taken, site frozen to substrate.
WQ-MS-S-03	Yes	Water levels were moderate. Channel snow covered with thin ice.
WQ-DRY	No	No sampling required at this time.
Quality Assurance/Quality Control Samples		
Field Replicate A	Yes	Collected from WQ-DC-U.
Field Replicate B	Yes	Collected from WQ-SEEP.
Field Blank	Yes	Samples prepared with lab-supplied de-ionized water at the site.
Trip Blank	Yes	Samples provided by lab and were transported to and from site.

3. Trip Photographs



Photo 1. H-DC-B Channel with flow, however excavator activity upstream prevented sampling, December 17, 2013.



Photo 2. H/WQ-DC-R – thick overflow conditions resulted in no sampling at this site December 17, 2013, looking upstream.



Photo 3. H/WQ-DC-R – thick overflow conditions resulted in no sampling at this site December 17, 2013, looking downstream.



Photo 4. H-VC-U open leads in stream at salt input site December 17, 2013, looking upstream.



Photo 5. H-VC-R Thick overflow ice resulting in 88 cm of ice at the well site December 16, 2013.



Photo 6. **WQ-MN** Two separate holes attempted, top left hole contained standing water while the hole on the right was frozen to bed December 17, 2013.



Photo 7. **H/WQ-VC-UMN** open thalweg above well site at typical water quality sampling site December 17, 2013, looking downstream.



Photo 8. WQ-DC-U Snow and ice covered with low flow December 17, 2013, site overview.

4. Additional Trip Information/Comments

Any changes to project scope (i.e. additional sites sampled):	None
Any alterations to sample scheduling:	Due to cold weather surveying was not conducted at most sites, and hydrometric sampling was limited to salt slugs.
Any events resulting in changes to budget:	None
Additional Comments:	None
Wildlife Sightings:	None
Site concerns including safety concerns:	None



Appendix A:
Water Quality Parameter Guideline Exceedances
November 12-14, 2013



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131114-025	0167-131114-024	0167-131114-023	0167-131114-026	0167-131113-001	0167-131113-002	0167-131113-003	0167-131113-004	0167-131113-005	0167-131113-006	0167-131113-007	0167-131113-010
				WQ Site ID	WQ-PIT-1	WQ_PIT-2	WQ-PIT-3	WQ-PW	WQ-VC-UMN	WQ-MN	WQ-VC-R	WQ-VC-DBC	WQ-VC-DBC-r	WQ-DC-R-r	WQ-DC-R	WQ-VC-REF
				Date Sampled	11/14/2013	11/14/2013	11/14/2013	11/14/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013
				Detection Limit												
Temperature (in-situ)	°C	-	-	-	0.9	2.0	4.8	0.5	0.0	0.0	0.0	0.0	-	-	0.1	0.0
Specific Conductivity (in-situ)	µS/cm	-	-	-	1905.0	1917.0	1977.0	369.7	228.8	106.9	218.0	214.9	-	-	1228.0	210.4
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.06	6.83	6.20	5.77	6.63	6.54	6.49	7.16	-	-	6.56	7.23
Turbidity (In-situ)	NTU	-	-	-	0.87	0.65	2.36	0.97	0.59	11.95	3.78	0.53	-	-	17.02	0.97
Dissolved Oxygen (in-situ)	mg/L	-	-	-	9.8	9.1	5.5	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	<5.0	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	1820	1650	2070	446	197	94	196	194	190	915	901	194
Hardness (as CaCO3)	mg/L	-	-	0.5	1200	1190	1620	196	114	51.7	107	105	107	653	655	105
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.97	7.91	7.36	7.79	7.73	7.42	7.7	7.7	7.77	7.43	7.48	7.76
Total Suspended Solids	mg/L	-	50	3	3.3	<3.0	4.7	-	<3.0	<3.0	<3.0	<3.0	<3.0	16.7	24.7	6.7
Total Dissolved Solids	mg/L	-	-	10	1560	1550	2180	201	123	56.3	117	114	113	891	890	111
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	179	172	191	-	90.1	48.7	88.3	91.9	90.1	197	197	89.7
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	179	172	191	163	90.1	48.7	88.3	91.9	90.1	197	197	89.7
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	<0.0050	0.0196	-	<0.0050	0.0574	0.0073	<0.0050	<0.0050	1.93	1.99	<0.0050
Chloride (Cl)	mg/L	120	-	0.5	<5.0	<5.0	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0
Fluoride (F)	mg/L	0.12	-	0.02	0.34	0.29	<0.40	0.108	0.052	0.068	0.053	0.052	0.051	<0.20	<0.20	0.054
Nitrate (as N)	mg/L	13	-	0.005	<0.050	<0.050	<0.10	0.143	0.136	0.0593	0.129	0.144	0.143	0.644	0.65	0.15
Nitrite (as N)	mg/L	0.06	-	0.001	<0.010	<0.010	<0.020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.023	0.025	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	1010	1010	1470	31.2	25.2	3.99	23.2	18.3	18.3	503	501	17.5
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0054	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0157	0.0197	<0.0050
Cyanate	mg/L	-	-	0.2	-	-	-	-	<2.0	<0.20	<0.20	<0.20	<0.20	0.69	1.56	0.25
Thiocyanate (SCN)	mg/L	-	-	0.5	-	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	0.73	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0084	0.0082	0.0369	<0.010	0.0385	0.0924	0.0368	0.0825	0.0551	0.205	0.29	0.057
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00367	0.00358	0.00203	<0.00050	0.00022	0.00013	0.00022	0.0001	0.00011	0.00067	0.00068	0.0001
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0115	0.0114	0.0411	0.00048	0.0008	0.00233	0.00093	0.00044	0.00038	0.0293	0.0314	0.00042
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0119	0.0118	0.00861	0.084	0.0722	0.0804	0.0725	0.0765	0.0754	0.0716	0.0746	0.0765
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.020	<0.020	<0.020	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	0.042	0.043	<0.010
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	0.00295	0.00292	0.00935	<0.00020	0.00002	0.000027	0.00002	0.000021	0.000022	0.000155	0.000172	0.000022
Calcium (Ca)-Total	mg/L	-	-	0.05	337	327	447	45.7	29.8	15.1	29.2	28.7	29.4	185	186	28.7
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00020	<0.00020	<0.00020	<0.0020	0.00015	0.00061	0.00024	0.00022	0.00022	0.00083	0.00081	0.00018
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	0.00103	-	<0.00010	0.00119	0.00015	<0.00010	<0.00010	0.00423	0.00422	<0.00010
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.0036	0.003	0.0046	<0.0010	0.00116	0.00194	0.00133	0.00116	0.00116	0.00178	0.00204	0.0012
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.047	0.057	0.366	<0.030	0.081	1.75	0.213	0.142	0.099	5.34	5.55	0.114
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	0.00072	0.00063	0.00272	0.00068	0.00062	<0.000050	0.00061	0.000115	0.000092	0.00076	0.00107	0.000087
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0101	0.0095	0.0114	-	0.0008	0.00113	0.00084	0.00084	0.00081	0.00098	0.00106	0.00082
Magnesium (Mg)-Total	mg/L	-	-	0.1	93.5	91.4	129	20	10.4	4.28	9.83	9.82	9.95	48.7	48.9	10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0705	0.0715	2.03	<0.0020	0.0439	0.36	0.067	0.0434	0.0412	3.8	3.78	0.0325
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.000010	<0.00020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00019	0.00017	0.00015	-	0.000377	0.000319	0.000373	0.000387	0.000403	0.000628	0.000638	0.000398
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	<0.0010	<0.0010	0.0013	-	<0.00050	0.00207	0.00051	<0.00050	<0.00050	0.00181	0.00181	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.057	0.057	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	4.13	3.86	5.25	0.87	0.78	0.98	0.79	0.72	0.7	4.54	4.54	0.69
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00020	<0.00020	<0.00020	<0.0010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	0.00017	0.00015	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	3.22	3.1	3.71	-	6.47	9.22	6.8	6.54	6.59	7.44	7.55	6.58
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000020	<0.000020	0.000049	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000016	0.000018	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	13.5	13	16.1	5.1	3.14	2.43	3.09	2.67	2.75	24	23.8	2.67
Strontium (Sr)-Total	mg/L	-	-	0.0002	1.1	1.07	1.26	-	0.313	0.0826	0.286	0.311	0.322	0.609	0.581	0.318
Sulfur (S)-Total	mg/L	-	-	0.5	345	335	482	-	8.7	1.61	8.15	6.39	6.48	171	172	6.25
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000065	0.000071	0.000139	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.020	<0.020	<0.020	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	0.02	<0.010



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131114-025	0167-131114-024	0167-131114-023	0167-131114-026	0167-131113-001	0167-131113-002	0167-131113-003	0167-131113-004	0167-131113-005	0167-131113-006	0167-131113-007	0167-131113-010
				WQ Site ID	WQ-PIT-1	WQ_PIT-2	WQ-PIT-3	WQ-PW	WQ-VC-UMN	WQ-MN	WQ-VC-R	WQ-VC-DBC	WQ-VC-DBC-r	WQ-DC-R-r	WQ-DC-R	WQ-VC-REF
				Date Sampled	11/14/2013	11/14/2013	11/14/2013	11/14/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013
				Detection Limit												
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00425	0.00427	0.00407	0.00179	0.000619	0.000221	0.000608	0.000647	0.000652	0.00189	0.00189	0.000674
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0020	<0.0020	<0.0020	-	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	0.0018	0.0019	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.359	0.355	0.825	<0.050	<0.0030	0.0034	<0.0030	<0.0030	<0.0030	0.0096	0.0103	<0.0030
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	-	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.0021	<0.0020	<0.0020	-	0.0082	0.0737	0.015	0.0083	0.008	0.0178	0.0176	0.0079
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00362	0.00349	0.00154	-	0.0002	0.00011	0.00019	<0.00010	<0.00010	0.00051	0.00052	<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00929	0.00923	0.0141	-	0.00065	0.00173	0.00073	0.00025	0.00028	0.021	0.0211	0.00026
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0117	0.0116	0.00773	-	0.0714	0.077	0.0705	0.0722	0.0752	0.0667	0.0664	0.0696
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.020	<0.020	<0.020	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.038	0.039	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	0.00291	0.00284	0.00893	-	0.000018	0.000026	0.00002	0.000023	0.000017	0.000107	0.000111	0.000014
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	331	324	443	-	29.5	14.2	27.7	26.9	27.6	181	182	26.5
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	0.00051	0.00012	<0.00010	<0.00010	0.00036	0.00037	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	0.00089	-	<0.00010	0.00109	0.00014	<0.00010	<0.00010	0.00392	0.00388	<0.00010
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.00245	0.00249	0.0022	-	0.001	0.00166	0.00109	0.00094	0.00093	0.00101	0.00097	0.00089
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	<0.010	<0.010	0.017	-	0.035	0.887	0.095	0.02	0.02	3.97	3.99	0.022
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	<0.00010	<0.00010	<0.00010	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0095	0.0094	0.0106	-	0.0007	0.00121	0.00081	0.00098	0.00077	0.0009	0.00103	0.0009
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	91.6	92.6	125	-	9.81	3.93	9.12	9.29	9.33	49.1	49	9.28
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0668	0.067	1.86	-	0.0398	0.345	0.0619	0.0359	0.0353	3.62	3.59	0.0272
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.00016	0.00016	<0.00010	-	0.00036	0.000277	0.000342	0.000366	0.000356	0.000587	0.000595	0.000363
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	<0.0010	<0.0010	0.0012	-	<0.00050	0.0018	<0.00050	<0.00050	<0.00050	0.00159	0.00157	<0.00050
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	3.77	3.83	4.92	-	0.69	0.88	0.7	0.62	0.62	4.45	4.29	0.6
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00015	0.00014	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	3.07	3.08	3.44	-	6.31	8.78	6.5	6.27	6.27	7.01	7.01	6.26
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000020	<0.000020	<0.000020	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	13	12.8	15.2	-	2.9	2.34	2.92	2.6	2.59	22.8	23	2.56
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	1.05	1.05	1.13	-	0.305	0.076	0.282	0.309	0.308	0.572	0.565	0.309
Sulfur (S)-Dissolved	mg/L	-	-	0.5	324	323	450	-	8.39	1.49	7.68	6.02	6.1	160	162	5.78
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	0.000059	0.000059	0.000121	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00020	<0.00020	<0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.020	<0.020	<0.020	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.00408	0.00409	0.0038	-	0.000607	0.000206	0.000567	0.000625	0.000596	0.00182	0.00177	0.000612
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0020	<0.0020	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.35	0.346	0.788	-	<0.0010	0.002	0.0011	<0.0010	0.0014	0.0069	0.0067	<0.0010



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131113-018	0167-131113-011	0167-131113-014	0167-131113-012	0167-131113-013	0167-131113-009	0167-131113-008	0167-131114-016	0167-131114-021	0167-131114-015	0167-131114-019	0167-131113-FIELD
				WQ Site ID	WQ-PC-D	WQ-SEEP	WQ-DC-U1	WQ-VC-U	WQ-TP	WQ-DC-U	WQ-DC-U2	WQ-DC-DX	WQ-DC-DX+105	WQ-DC-D1b	WQ-MS-S-03	FIELD BLANK
				Date Sampled	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/14/2013	11/14/2013	11/14/2013	11/14/2013	11/13/2013
				Detection Limit												
Temperature (in-situ)	°C	-	-	-	0.3	0.7	0.0	0.0	1.8	0.0	0.0	0.0	0.6	0.0	0.6	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	465.8	1799.0	1377.0	213.7	1583.0	1540.0	1450.0	740.0	1187.0	1717.0	1255.0	-
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	7.08	6.70	6.99	7.08	7.19	6.80	7.00	6.90	6.69	6.91	6.64	-
Turbidity (In-situ)	NTU	-	-	-	1.04	37.80	2.09	0.31	6.62	22.30	1.82	58.90	2.62	59.50	1.86	-
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	361	1420	1070	196	1310	1220	1140	557	935	1260	922	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	227	1030	848	106	941	886	881	394	713	1080	730	<0.50
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.2	7.25	7.53	7.67	7.83	7.5	7.76	7.45	7.54	7.74	7.52	6.03
Total Suspended Solids	mg/L	-	50	3	8	28.7	6.7	<3.0	<3.0	14	8	23.3	<3.0	55.3	142	<3.0
Total Dissolved Solids	mg/L	-	-	10	266	1450	1040	114	1310	1210	1080	482	846	1310	873	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	108	251	208	92.1	143	230	237	138	272	299	271	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	108	251	208	92.1	143	230	237	138	272	299	271	<1.0
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	3.7	0.0612	<0.0050	0.31	3	0.078	0.0053	0.0222	0.211	0.0415	<0.0050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<5.0	<5.0	<0.50	<5.0	<5.0	<5.0	<0.50	<5.0	<5.0	<5.0	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.059	<0.20	<0.20	0.051	0.35	<0.20	<0.20	0.061	0.24	<0.20	0.29	<0.020
Nitrate (as N)	mg/L	13	-	0.005	<0.0050	1.24	0.061	0.143	0.19	0.831	0.155	0.048	<0.050	0.122	<0.050	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	0.026	<0.010	<0.0010	<0.010	0.02	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	115	863	617	18.2	839	705	630	250	427	760	447	<0.50
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	0.0051	<0.0050	<0.0050	<0.0050	0.0105	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	0.0393	<0.0050	<0.0050	<0.0050	0.0287	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	2.07	0.27	<0.20	<2.0	0.99	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	3.25	<0.50	<0.50	<0.50	2.17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.437	0.0158	0.034	0.0374	0.0245	0.0194	0.0913	1.31	0.0306	0.688	0.115	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00656	0.00066	0.00433	0.00013	0.0454	0.0005	0.00341	0.00173	0.0118	0.0276	0.0146	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0221	0.0592	0.0132	0.00035	0.239	0.0456	0.00472	0.0382	0.0425	0.293	0.115	<0.00010
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0302	0.0671	0.0548	0.0772	0.0156	0.0658	0.058	0.0649	0.0122	0.0409	0.0197	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	0.077	0.031	<0.010	0.123	0.06	0.033	<0.010	<0.010	0.052	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	0.00248	0.000707	0.000074	0.00002	0.00123	0.000397	0.000079	0.000114	0.00389	0.00286	0.00277	<0.000010
Calcium (Ca)-Total	mg/L	-	-	0.05	68.8	301	191	29.1	282	256	207	103	185	236	192	<0.050
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00052	0.00051	0.00024	0.00019	0.00022	0.00042	0.00028	0.00203	<0.00010	0.00143	0.00017	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00026	0.00792	0.00038	<0.00010	0.00121	0.00589	0.00034	0.00085	0.00054	0.00077	0.00117	<0.00010
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	0.0282	0.00428	0.00125	0.00121	0.0237	0.00289	0.00102	0.00409	<0.00050	0.0101	0.00178	<0.00050
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.794	11.9	1.43	0.084	0.504	6.05	0.922	5.63	0.343	8.22	2.84	<0.010
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	0.0137	0.000063	0.000088	0.000059	0.00367	0.000057	0.000105	0.00321	0.000152	0.0721	0.00477	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0005	0.00224	0.00109	0.00361	0.00075	0.0102	0.00078	0.00557	0.00118	0.00938	0.00893	0.00978	<0.00050
Magnesium (Mg)-Total	mg/L	-	-	0.1	15.7	73.7	92	10	60.4	65.2	96.7	28.6	62.7	112	64.7	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.148	6.25	0.256	0.0411	0.82	5.03	0.338	0.339	1.1	1.26	1.35	<0.000050
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00011	0.00117	0.000328	0.000396	0.00211	0.00094	0.000273	0.000103	0.000387	0.000323	0.000361	<0.000050
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	0.00094	0.00268	0.00089	<0.00050	0.00165	0.00213	0.00076	0.00115	0.00152	0.00152	0.00182	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.067	<0.050	0.069	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	1.01	7.39	4.16	0.71	18.9	6.33	4.51	5.61	4.05	5.32	4.07	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010	0.00024	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	7.32	7.61	7	6.59	2.48	6.92	7.22	7.42	6.82	8.42	7.05	<0.050
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.000166	0.000042	<0.000010	<0.000010	0.000095	0.000024	<0.000010	0.000088	<0.000010	0.000968	0.000054	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	4.4	40.6	7.59	2.71	23.6	32.3	8.28	5.02	5.28	7.76	5	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.489	0.955	0.534	0.324	0.789	0.82	0.609	0.291	0.462	0.65	0.48	<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5	40.8	299	213	6.52	285	245	219	81.1	146	245	152	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000018	<0.000010	<0.000010	<0.000010	0.000224	<0.000010	<0.000010	0.000046	0.000108	0.000061	0.000095	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.049	<0.010	0.03	<0.010	<0.010



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131113-018	0167-131113-011	0167-131113-014	0167-131113-012	0167-131113-013	0167-131113-009	0167-131113-008	0167-131114-016	0167-131114-021	0167-131114-015	0167-131114-019	0167-131113-FIELD
				WQ Site ID	WQ-PC-D	WQ-SEEP	WQ-DC-U1	WQ-VC-U	WQ-TP	WQ-DC-U	WQ-DC-U2	WQ-DC-DX	WQ-DC-DX+105	WQ-DC-D1b	WQ-MS-S-03	FIELD BLANK
				Date Sampled	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/13/2013	11/14/2013	11/14/2013	11/14/2013	11/14/2013	11/13/2013
				Detection Limit												
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000744	0.00394	0.00246	0.000626	0.00138	0.00281	0.00285	0.00041	0.00452	0.00332	0.00401	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.001	0.0011	0.002	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	0.006	<0.0010	0.0033	<0.0010	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.229	0.0076	0.0298	<0.0030	0.143	0.0059	0.0367	0.0118	0.684	0.517	0.812	<0.0030
Dissolved Metals Filtration Location		-	-	n/a	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	0.0083	0.0096	0.0155	0.0079	0.0024	0.0083	0.0035	0.0029	0.0013	0.0022	0.0011	<0.0010
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00423	0.00056	0.00422	<0.00010	0.0445	0.00043	0.0033	0.00072	0.0115	0.0089	0.013	<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.0033	0.0426	0.0118	0.00025	0.142	0.0351	0.0033	0.00108	0.0164	0.016	0.0817	<0.00010
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0201	0.0621	0.0538	0.0726	0.0149	0.0604	0.0547	0.0415	0.0115	0.0262	0.017	<0.000050
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	0.068	0.026	<0.010	0.115	0.053	0.027	<0.010	<0.010	0.047	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	0.00197	0.000378	0.000051	0.00002	0.00108	0.000218	0.000071	<0.000010	0.00196	0.000499	0.000435	<0.000010
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	66.2	293	189	26.9	276	249	197	108	182	242	185	<0.050
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	0.00036	0.00016	<0.00010	<0.00010	0.0003	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00752	0.00037	<0.00010	0.00113	0.00571	0.00029	<0.00010	0.00048	0.00036	0.00109	<0.00010
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	0.0125	0.00189	0.00078	0.00092	0.0195	0.00139	0.00056	0.00069	<0.00020	0.00059	<0.00020	<0.00020
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.013	8.63	1.27	0.019	0.051	4.07	0.546	0.028	0.096	0.294	2.07	<0.010
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	0.000666	<0.000050	<0.000050	<0.000050	0.000351	<0.000050	<0.000050	<0.000050	<0.000050	0.000161	0.000077	<0.000050
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.00212	0.00092	0.00353	0.00067	0.0105	0.00074	0.00505	0.00055	0.00941	0.00842	0.00998	<0.00050
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	14.8	72.2	91.5	9.31	61.3	64.3	94.7	30.2	62.7	115	64.9	<0.10
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0974	5.89	0.237	0.0348	0.75	4.78	0.313	0.134	1.04	1.03	1.27	<0.000050
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	0.00008	0.00103	0.000338	0.000371	0.00194	0.000872	0.000245	<0.000050	0.000359	0.000238	0.000323	<0.000050
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	0.00063	0.00263	0.00075	<0.00050	0.00152	0.00193	0.00058	<0.00050	0.00145	0.00086	0.00163	<0.00050
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	0.86	6.93	3.97	0.61	18.5	5.87	4.14	4.9	3.75	5.18	3.76	<0.10
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.00010	0.00022	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	6.55	7.17	6.9	6.31	2.37	6.62	6.73	5.26	6.6	6.81	6.62	<0.050
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	<0.000010	0.000013	<0.000010	<0.000010	0.000027	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	4.1	38.2	7.23	2.59	22.8	31.2	7.75	4.95	5.16	7.9	4.98	<0.050
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.466	0.865	0.492	0.318	0.74	0.792	0.586	0.316	0.435	0.653	0.445	<0.00020
Sulfur (S)-Dissolved	mg/L	-	-	0.5	38.5	274	200	6.06	273	227	202	82.6	137	239	142	<0.50
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	0.000221	<0.000010	<0.000010	<0.000010	0.000097	0.000017	0.000078	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000646	0.00371	0.0023	0.000584	0.00132	0.00272	0.00262	0.00035	0.0043	0.00336	0.00394	<0.000010
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.192	0.0065	0.0271	0.0014	0.124	0.005	0.0326	<0.0010	0.657	0.312	0.781	<0.0010



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131114-TRAVEL
				WQ Site ID	TRAVEL BLANK
				Date Sampled	11/14/2013
				Detection Limit	
Temperature (in-situ)	°C	-	-	-	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	-
pH (in-situ)	-	6.5 - 9.0	6.0 - 8.5	-	-
Turbidity (In-situ)	NTU	-	-	-	-
Dissolved Oxygen (in-situ)	mg/L	-	-	-	-
Colour, True	CU	15	-	5	-
Conductivity	µS/cm	-	-	2	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	-
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	5.87
Total Suspended Solids	mg/L	-	50	3	<3.0
Total Dissolved Solids	mg/L	-	-	10	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	<1.0
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.0333
Chloride (Cl)	mg/L	120	-	0.5	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	<0.020
Nitrate (as N)	mg/L	13	-	0.005	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	<0.50
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	<0.00010
Barium (Ba)-Total	mg/L	-	1	0.00005	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010
Cadmium (Cd)-Total	mg/L	0.000033	0.02	0.00001	<0.000010
Calcium (Ca)-Total	mg/L	-	-	0.05	<0.050
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010
Copper (Cu)-Total	mg/L	0.002	0.2	0.0005	<0.00050
Iron (Fe)-Total	mg/L	0.3	1	0.01	<0.010
Lead (Pb)-Total	mg/L	0.003	0.1	0.00005	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050
Magnesium (Mg)-Total	mg/L	-	-	0.1	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	<0.000050
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000010
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	<0.000050
Nickel (Ni)-Total	mg/L	0.1	0.3	0.0005	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	<0.050
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010

Applied Guidelines: - Federal CCME Canadian Environmental Quality Guidelines (JUL, 2012), CCME: Freshwater Aquatic Life
 - Mount Nansen Effluent Quality Standards

Color Key: Exceeds CCME Guideline
 Exceeds MN Effluent Quality Standards (EQS)
 Exceeds both CCME and EQS

Note: For those guidelines that are hardness dependent, the most conservative guideline has been applied.



Table A1. Water Quality Results for the November 12-14, 2013 Trip.

Analyte	Units	CCME-WATER-FAL	Mount Nansen Effluent Discharge Standards	Sample ID	0167-131114-TRAVEL
				WQ Site ID	TRAVEL BLANK
				Date Sampled	11/14/2013
				Detection Limit	
Uranium (U)-Total	mg/L	0.015	-	0.00001	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030
Dissolved Metals Filtration Location		-	-	n/a	-
Aluminum (Al)-Dissolved	mg/L	0.005	-	0.001	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	-
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	-
Boron (B)-Dissolved	mg/L	-	-	0.01	-
Cadmium (Cd)-Dissolved	mg/L	0.000033	-	0.00001	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	-
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	-
Copper (Cu)-Dissolved	mg/L	0.002	-	0.0002	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.00005	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	-	0.00005	-
Nickel (Ni)-Dissolved	mg/L	0.1	-	0.0005	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	-



Appendix B:
ALS Analytical Reports
November 12-14, 2013



ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195- 2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 14-NOV-13
Report Date: 25-NOV-13 16:31 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1392004
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1, 2, 3, 4
Legal Site Desc:

Can Dang
Senior Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1392004-1 Water 13-NOV-13 10:28 0167-131113-001	L1392004-2 Water 13-NOV-13 09:30 0167-131113-002	L1392004-3 Water 13-NOV-13 08:40 0167-131113-003	L1392004-4 Water 13-NOV-13 13:58 0167-131113-004	L1392004-5 Water 13-NOV-13 14:10 0167-131113-005	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	197	94.0	196	194	190
	Hardness (as CaCO3) (mg/L)	114	51.7	107	105	107
	pH (pH)	7.73	7.42	7.70	7.70	7.77
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
	Total Dissolved Solids (mg/L)	123	56.3	117	114	113
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	90.1	48.7	88.3	91.9	90.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	90.1	48.7	88.3	91.9	90.1
	Ammonia, Total (as N) (mg/L)	<0.0050	0.0574	0.0073	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.052	0.068	0.053	0.052	0.051
	Nitrate (as N) (mg/L)	0.136	0.0593	0.129	0.144	0.143
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	25.2	3.99	23.2	18.3	18.3
	Anion Sum (meq/L)	2.34	1.06	2.26	2.23	2.19
	Cation Sum (meq/L)	2.43	1.23	2.29	2.24	2.28
	Cation - Anion Balance (%)	1.8	7.2	0.6	0.1	1.9
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<2.0 ^{DLIS}	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0385	0.0924	0.0368	0.0825	0.0551
	Antimony (Sb)-Total (mg/L)	0.00022	0.00013	0.00022	0.00010	0.00011
	Arsenic (As)-Total (mg/L)	0.00080	0.00233	0.00093	0.00044	0.00038
	Barium (Ba)-Total (mg/L)	0.0722	0.0804	0.0725	0.0765	0.0754
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000020	0.000027	0.000020	0.000021	0.000022
	Calcium (Ca)-Total (mg/L)	29.8	15.1	29.2	28.7	29.4
	Chromium (Cr)-Total (mg/L)	0.00015	0.00061	0.00024	0.00022	0.00022
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00119	0.00015	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.00116	0.00194	0.00133	0.00116	0.00116
	Iron (Fe)-Total (mg/L)	0.081	1.75	0.213	0.142	0.099
	Lead (Pb)-Total (mg/L)	0.000062	<0.000050	0.000061	0.000115	0.000092
	Lithium (Li)-Total (mg/L)	0.00080	0.00113	0.00084	0.00084	0.00081

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1392004-6 Water 13-NOV-13 11:40 0167-131113-006	L1392004-7 Water 13-NOV-13 11:40 0167-131113-007	L1392004-8 Water 13-NOV-13 15:40 0167-131113-010	L1392004-9 Water 13-NOV-13 18:40 0167-131113-018	L1392004-10 Water 13-NOV-13 17:05 0167-131113-011	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	915	901	194	361	1420
	Hardness (as CaCO3) (mg/L)	653	655	105	227	1030
	pH (pH)	7.43	7.48	7.76	7.20	7.25
	Total Suspended Solids (mg/L)	16.7	24.7	6.7	8.0	28.7
	Total Dissolved Solids (mg/L)	891	890	111	266	1450
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	197	197	89.7	108	251
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	197	197	89.7	108	251
	Ammonia, Total (as N) (mg/L)	1.93	1.99	<0.0050	<0.0050	3.70
	Chloride (Cl) (mg/L)	<5.0 ^{DLA}	<5.0 ^{DLA}	<0.50	<0.50	<5.0 ^{DLA}
	Fluoride (F) (mg/L)	<0.20 ^{DLA}	<0.20 ^{DLA}	0.054	0.059	<0.20 ^{DLA}
	Nitrate (as N) (mg/L)	0.644	0.650	0.150	<0.0050	1.24
	Nitrite (as N) (mg/L)	0.023	0.025	<0.0010	<0.0010	0.026
	Sulfate (SO4) (mg/L)	503	501	17.5	115	863
	Anion Sum (meq/L)	14.4	14.4	2.17	4.56	23.1
	Cation Sum (meq/L)	14.6	14.7	2.22	4.74	23.3
	Cation - Anion Balance (%)	0.6	0.9	1.1	1.9	0.5
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0054	<0.0050	<0.0050	<0.0050	0.0051
	Cyanide, Total (mg/L)	0.0157	0.0197	<0.0050	<0.0050	0.0393
	Cyanate (mg/L)	0.69	1.56	0.25	<0.20	2.07
	Thiocyanate (SCN) (mg/L)	0.73	0.73	<0.50	<0.50	3.25
Total Metals	Aluminum (Al)-Total (mg/L)	0.205	0.290	0.0570	0.437	0.0158
	Antimony (Sb)-Total (mg/L)	0.00067	0.00068	0.00010	0.00656	0.00066
	Arsenic (As)-Total (mg/L)	0.0293	0.0314	0.00042	0.0221	0.0592
	Barium (Ba)-Total (mg/L)	0.0716	0.0746	0.0765	0.0302	0.0671
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.042	0.043	<0.010	<0.010	0.077
	Cadmium (Cd)-Total (mg/L)	0.000155	0.000172	0.000022	0.00248	0.000707
	Calcium (Ca)-Total (mg/L)	185	186	28.7	68.8	301
	Chromium (Cr)-Total (mg/L)	0.00083	0.00081	0.00018	0.00052	0.00051
	Cobalt (Co)-Total (mg/L)	0.00423	0.00422	<0.00010	0.00026	0.00792
	Copper (Cu)-Total (mg/L)	0.00178	0.00204	0.00120	0.0282	0.00428
	Iron (Fe)-Total (mg/L)	5.34	5.55	0.114	0.794	11.9
	Lead (Pb)-Total (mg/L)	0.000760	0.00107	0.000087	0.0137	0.000063
	Lithium (Li)-Total (mg/L)	0.00098	0.00106	0.00082	0.00224	0.00109

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1392004-11 Water 13-NOV-13 18:05 0167-131113-014	L1392004-12 Water 13-NOV-13 14:30 0167-131113-012	L1392004-13 Water 13-NOV-13 17:40 0167-131113-013	L1392004-14 Water 13-NOV-13 16:55 0167-131113-009	L1392004-15 Water 13-NOV-13 18:05 0167-131113-008
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	1070	196	1310	1220	1140
	Hardness (as CaCO3) (mg/L)	848	106	941	886	881
	pH (pH)	7.53	7.67	7.83	7.50	7.76
	Total Suspended Solids (mg/L)	6.7	<3.0	<3.0	14.0	8.0
	Total Dissolved Solids (mg/L)	1040	114	1310	1210	1080
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	208	92.1	143	230	237
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	208	92.1	143	230	237
	Ammonia, Total (as N) (mg/L)	0.0612	<0.0050	0.310	3.00	0.0780
	Chloride (Cl) (mg/L)	<5.0 ^{DLA}	<0.50	<5.0 ^{DLA}	<5.0 ^{DLA}	<5.0 ^{DLA}
	Fluoride (F) (mg/L)	<0.20 ^{DLA}	0.051	0.35	<0.20 ^{DLA}	<0.20 ^{DLA}
	Nitrate (as N) (mg/L)	0.061	0.143	0.190	0.831	0.155
	Nitrite (as N) (mg/L)	<0.010 ^{DLA}	<0.0010	<0.010 ^{DLA}	0.020	<0.010 ^{DLA}
	Sulfate (SO4) (mg/L)	617	18.2	839	705	630
	Anion Sum (meq/L)	17.0	2.23	20.4	19.3	17.9
	Cation Sum (meq/L)	17.4	2.24	20.3	19.8	18.1
	Cation - Anion Balance (%)	1.3	0.2	-0.1	1.2	0.7
	Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	0.0105
Cyanide, Total (mg/L)		<0.0050	<0.0050	<0.0050	0.0287	<0.0050
Cyanate (mg/L)		0.27	<0.20	<2.0 ^{DLIS}	0.99	<0.20
Thiocyanate (SCN) (mg/L)		<0.50	<0.50	<0.50	2.17	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0340	0.0374	0.0245	0.0194	0.0913
	Antimony (Sb)-Total (mg/L)	0.00433	0.00013	0.0454	0.00050	0.00341
	Arsenic (As)-Total (mg/L)	0.0132	0.00035	0.239	0.0456	0.00472
	Barium (Ba)-Total (mg/L)	0.0548	0.0772	0.0156	0.0658	0.0580
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.031	<0.010	0.123	0.060	0.033
	Cadmium (Cd)-Total (mg/L)	0.000074	0.000020	0.00123	0.000397	0.000079
	Calcium (Ca)-Total (mg/L)	191	29.1	282	256	207
	Chromium (Cr)-Total (mg/L)	0.00024	0.00019	0.00022	0.00042	0.00028
	Cobalt (Co)-Total (mg/L)	0.00038	<0.00010	0.00121	0.00589	0.00034
	Copper (Cu)-Total (mg/L)	0.00125	0.00121	0.0237	0.00289	0.00102
	Iron (Fe)-Total (mg/L)	1.43	0.084	0.504	6.05	0.922
	Lead (Pb)-Total (mg/L)	0.000088	0.000059	0.00367	0.000057	0.000105
	Lithium (Li)-Total (mg/L)	0.00361	0.00075	0.0102	0.00078	0.00557

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1392004-16 Water 14-NOV-13 10:50 0167-131114-016	L1392004-17 Water 14-NOV-13 10:20 0167-131114-021	L1392004-18 Water 14-NOV-13 09:28 0167-131114-015	L1392004-19 Water 14-NOV-13 10:12 0167-131114-019	L1392004-20 Water 13-NOV-13 20:00 0167-131113- FIELD BLANK
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	557	935	1260	922	<2.0
	Hardness (as CaCO3) (mg/L)	394	713	1080	730	<0.50
	pH (pH)	7.45	7.54	7.74	7.52	6.03
	Total Suspended Solids (mg/L)	23.3	<3.0	55.3	142	<3.0
	Total Dissolved Solids (mg/L)	482	846	1310	873	<1.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	138	272	299	271	<1.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	138	272	299	271	<1.0
	Ammonia, Total (as N) (mg/L)	0.0053	0.0222	0.211	0.0415	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<5.0 ^{DLA}	<5.0 ^{DLA}	<5.0 ^{DLA}	<0.50
	Fluoride (F) (mg/L)	0.061	0.24	<0.20 ^{DLA}	0.29	<0.020
	Nitrate (as N) (mg/L)	0.0480	<0.050 ^{DLA}	0.122 ^{DLA}	<0.050 ^{DLA}	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.010 ^{DLA}	<0.010 ^{DLA}	<0.010 ^{DLA}	<0.0010
	Sulfate (SO4) (mg/L)	250	427	760	447	<0.50
	Anion Sum (meq/L)	7.99	14.3	21.8	14.7	<0.10
	Cation Sum (meq/L)	8.22	14.6	22.1	15.1	<0.10
	Cation - Anion Balance (%)	1.5	1.0	0.7	1.2	0.0
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	1.31	0.0306	0.688	0.115	<0.0030
	Antimony (Sb)-Total (mg/L)	0.00173	0.0118	0.0276	0.0146	<0.00010
	Arsenic (As)-Total (mg/L)	0.0382	0.0425	0.293	0.115	<0.00010
	Barium (Ba)-Total (mg/L)	0.0649	0.0122	0.0409	0.0197	<0.000050
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.052	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000114	0.00389	0.00286	0.00277	<0.000010
	Calcium (Ca)-Total (mg/L)	103	185	236	192	<0.050
	Chromium (Cr)-Total (mg/L)	0.00203	<0.00010	0.00143	0.00017	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00085	0.00054	0.00077	0.00117	<0.00010
	Copper (Cu)-Total (mg/L)	0.00409	<0.00050	0.0101	0.00178	<0.00050
	Iron (Fe)-Total (mg/L)	5.63	0.343	8.22	2.84	<0.010
	Lead (Pb)-Total (mg/L)	0.00321	0.000152	0.0721	0.00477	<0.000050
	Lithium (Li)-Total (mg/L)	0.00118	0.00938	0.00893	0.00978	<0.00050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L1392004-21 Water 14-NOV-13 16:15 0167-131114- TRAVEL BLANK				
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	<2.0			
	Hardness (as CaCO3) (mg/L)				
	pH (pH)	5.87			
	Total Suspended Solids (mg/L)	<3.0			
	Total Dissolved Solids (mg/L)	<1.0			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<1.0			
	Ammonia, Total (as N) (mg/L)	0.0333 ^{RRV}			
	Chloride (Cl) (mg/L)	<0.50			
	Fluoride (F) (mg/L)	<0.020			
	Nitrate (as N) (mg/L)	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010			
	Sulfate (SO4) (mg/L)	<0.50			
	Anion Sum (meq/L)	<0.10			
	Cation Sum (meq/L)	<0.10			
	Cation - Anion Balance (%)	0.0			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050			
	Cyanide, Total (mg/L)	<0.0050			
	Cyanate (mg/L)	<0.20			
	Thiocyanate (SCN) (mg/L)	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030			
	Antimony (Sb)-Total (mg/L)	<0.00010			
	Arsenic (As)-Total (mg/L)	<0.00010			
	Barium (Ba)-Total (mg/L)	<0.000050			
	Beryllium (Be)-Total (mg/L)	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.00050			
	Boron (B)-Total (mg/L)	<0.010			
	Cadmium (Cd)-Total (mg/L)	<0.000010			
	Calcium (Ca)-Total (mg/L)	<0.050			
	Chromium (Cr)-Total (mg/L)	<0.00010			
	Cobalt (Co)-Total (mg/L)	<0.00010			
	Copper (Cu)-Total (mg/L)	<0.00050			
	Iron (Fe)-Total (mg/L)	<0.010			
	Lead (Pb)-Total (mg/L)	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.00050			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1392004-1 Water 13-NOV-13 10:28 0167-131113-001	L1392004-2 Water 13-NOV-13 09:30 0167-131113-002	L1392004-3 Water 13-NOV-13 08:40 0167-131113-003	L1392004-4 Water 13-NOV-13 13:58 0167-131113-004	L1392004-5 Water 13-NOV-13 14:10 0167-131113-005
Grouping	Analyte					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	10.4	4.28	9.83	9.82	9.95
	Manganese (Mn)-Total (mg/L)	0.0439	0.360	0.0670	0.0434	0.0412
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000377	0.000319	0.000373	0.000387	0.000403
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00207	0.00051	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.78	0.98	0.79	0.72	0.70
	Selenium (Se)-Total (mg/L)	<0.00010	0.00011	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	6.47	9.22	6.80	6.54	6.59
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	3.14	2.43	3.09	2.67	2.75
	Strontium (Sr)-Total (mg/L)	0.313	0.0826	0.286	0.311	0.322
	Sulfur (S)-Total (mg/L)	8.70	1.61	8.15	6.39	6.48
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000619	0.000221	0.000608	0.000647	0.000652
	Vanadium (V)-Total (mg/L)	<0.0010	0.0012	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030	0.0034	<0.0030	<0.0030	<0.0030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0082	0.0737	0.0150	0.0083	0.0080
	Antimony (Sb)-Dissolved (mg/L)	0.00020	0.00011	0.00019	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00065	0.00173	0.00073	0.00025	0.00028
	Barium (Ba)-Dissolved (mg/L)	0.0714	0.0770	0.0705	0.0722	0.0752
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000018	0.000026	0.000020	0.000023	0.000017
	Calcium (Ca)-Dissolved (mg/L)	29.5	14.2	27.7	26.9	27.6
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00051	0.00012	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00109	0.00014	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00100	0.00166	0.00109	0.00094	0.00093
	Iron (Fe)-Dissolved (mg/L)	0.035	0.887	0.095	0.020	0.020
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00070	0.00121	0.00081	0.00098	0.00077
	Magnesium (Mg)-Dissolved (mg/L)	9.81	3.93	9.12	9.29	9.33

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1392004-6	L1392004-7	L1392004-8	L1392004-9	L1392004-10
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13
		Sampled Time	11:40	11:40	15:40	18:40	17:05
		Client ID	0167-131113-006	0167-131113-007	0167-131113-010	0167-131113-018	0167-131113-011
Grouping	Analyte						
WATER							
Total Metals	Magnesium (Mg)-Total (mg/L)		48.7	48.9	10.0	15.7	73.7
	Manganese (Mn)-Total (mg/L)		3.80	3.78	0.0325	0.148	6.25
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.000628	0.000638	0.000398	0.000110	0.00117
	Nickel (Ni)-Total (mg/L)		0.00181	0.00181	<0.00050	0.00094	0.00268
	Phosphorus (P)-Total (mg/L)		0.057	0.057	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		4.54	4.54	0.69	1.01	7.39
	Selenium (Se)-Total (mg/L)		0.00017	0.00015	<0.00010	<0.00010	0.00024
	Silicon (Si)-Total (mg/L)		7.44	7.55	6.58	7.32	7.61
	Silver (Ag)-Total (mg/L)		0.000016	0.000018	<0.000010	0.000166	0.000042
	Sodium (Na)-Total (mg/L)		24.0	23.8	2.67	4.40	40.6
	Strontium (Sr)-Total (mg/L)		0.609	0.581	0.318	0.489	0.955
	Sulfur (S)-Total (mg/L)		171	172	6.25	40.8	299
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	<0.000010	0.000018	<0.000010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		0.016	0.020	<0.010	0.018	<0.010
	Uranium (U)-Total (mg/L)		0.00189	0.00189	0.000674	0.000744	0.00394
	Vanadium (V)-Total (mg/L)		0.0018	0.0019	<0.0010	0.0011	0.0020
	Zinc (Zn)-Total (mg/L)		0.0096	0.0103	<0.0030	0.229	0.0076
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0178	0.0176	0.0079	0.0083	0.0096
	Antimony (Sb)-Dissolved (mg/L)		0.00051	0.00052	<0.00010	0.00423	0.00056
	Arsenic (As)-Dissolved (mg/L)		0.0210	0.0211	0.00026	0.00330	0.0426
	Barium (Ba)-Dissolved (mg/L)		0.0667	0.0664	0.0696	0.0201	0.0621
	Beryllium (Be)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)		0.038	0.039	<0.010	<0.010	0.068
	Cadmium (Cd)-Dissolved (mg/L)		0.000107	0.000111	0.000014	0.00197	0.000378
	Calcium (Ca)-Dissolved (mg/L)		181	182	26.5	66.2	293
	Chromium (Cr)-Dissolved (mg/L)		0.00036	0.00037	<0.00010	<0.00010	0.00036
	Cobalt (Co)-Dissolved (mg/L)		0.00392	0.00388	<0.00010	<0.00010	0.00752
	Copper (Cu)-Dissolved (mg/L)		0.00101	0.00097	0.00089	0.0125	0.00189
	Iron (Fe)-Dissolved (mg/L)		3.97	3.99	0.022	0.013	8.63
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	0.000666	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00090	0.00103	0.00090	0.00212	0.00092
	Magnesium (Mg)-Dissolved (mg/L)		49.1	49.0	9.28	14.8	72.2

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1392004-11	L1392004-12	L1392004-13	L1392004-14	L1392004-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13
		Sampled Time	18:05	14:30	17:40	16:55	18:05
		Client ID	0167-131113-014	0167-131113-012	0167-131113-013	0167-131113-009	0167-131113-008
Grouping	Analyte						
WATER							
Total Metals	Magnesium (Mg)-Total (mg/L)		92.0	10.0	60.4	65.2	96.7
	Manganese (Mn)-Total (mg/L)		0.256	0.0411	0.820	5.03	0.338
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.000328	0.000396	0.00211	0.000940	0.000273
	Nickel (Ni)-Total (mg/L)		0.00089	<0.00050	0.00165	0.00213	0.00076
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		4.16	0.71	18.9	6.33	4.51
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	<0.00010	0.00020	<0.00010
	Silicon (Si)-Total (mg/L)		7.00	6.59	2.48	6.92	7.22
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010	0.000095	0.000024	<0.000010
	Sodium (Na)-Total (mg/L)		7.59	2.71	23.6	32.3	8.28
	Strontium (Sr)-Total (mg/L)		0.534	0.324	0.789	0.820	0.609
	Sulfur (S)-Total (mg/L)		213	6.52	285	245	219
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	0.000224	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		0.00246	0.000626	0.00138	0.00281	0.00285
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	0.0012	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0298	<0.0030	0.143	0.0059	0.0367
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0155	0.0079	0.0024	0.0083	0.0035
	Antimony (Sb)-Dissolved (mg/L)		0.00422	<0.00010	0.0445	0.00043	0.00330
	Arsenic (As)-Dissolved (mg/L)		0.0118	0.00025	0.142	0.0351	0.00330
	Barium (Ba)-Dissolved (mg/L)		0.0538	0.0726	0.0149	0.0604	0.0547
	Beryllium (Be)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)		0.026	<0.010	0.115	0.053	0.027
	Cadmium (Cd)-Dissolved (mg/L)		0.000051	0.000020	0.00108	0.000218	0.000071
	Calcium (Ca)-Dissolved (mg/L)		189	26.9	276	249	197
	Chromium (Cr)-Dissolved (mg/L)		0.00016	<0.00010	<0.00010	0.00030	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		0.00037	<0.00010	0.00113	0.00571	0.00029
	Copper (Cu)-Dissolved (mg/L)		0.00078	0.00092	0.0195	0.00139	0.00056
	Iron (Fe)-Dissolved (mg/L)		1.27	0.019	0.051	4.07	0.546
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	0.000351	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00353	0.00067	0.0105	0.00074	0.00505
	Magnesium (Mg)-Dissolved (mg/L)		91.5	9.31	61.3	64.3	94.7

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1392004-16	L1392004-17	L1392004-18	L1392004-19	L1392004-20
		Description	Water	Water	Water	Water	Water
		Sampled Date	14-NOV-13	14-NOV-13	14-NOV-13	14-NOV-13	13-NOV-13
		Sampled Time	10:50	10:20	09:28	10:12	20:00
		Client ID	0167-131114-016	0167-131114-021	0167-131114-015	0167-131114-019	0167-131113-FIELD BLANK
Grouping	Analyte						
WATER							
Total Metals	Magnesium (Mg)-Total (mg/L)		28.6	62.7	112	64.7	<0.10
	Manganese (Mn)-Total (mg/L)		0.339	1.10	1.26	1.35	<0.000050
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	0.000011	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.000103	0.000387	0.000323	0.000361	<0.000050
	Nickel (Ni)-Total (mg/L)		0.00115	0.00152	0.00152	0.00182	<0.00050
	Phosphorus (P)-Total (mg/L)		0.067	<0.050	0.069	<0.050	<0.050
	Potassium (K)-Total (mg/L)		5.61	4.05	5.32	4.07	<0.10
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	0.00011	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)		7.42	6.82	8.42	7.05	<0.050
	Silver (Ag)-Total (mg/L)		0.000088	<0.000010	0.000968	0.000054	<0.000010
	Sodium (Na)-Total (mg/L)		5.02	5.28	7.76	5.00	<0.050
	Strontium (Sr)-Total (mg/L)		0.291	0.462	0.650	0.480	<0.00020
	Sulfur (S)-Total (mg/L)		81.1	146	245	152	<0.50
	Thallium (Tl)-Total (mg/L)		0.000046	0.000108	0.000061	0.000095	<0.000010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	0.00011	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		0.049	<0.010	0.030	<0.010	<0.010
	Uranium (U)-Total (mg/L)		0.000410	0.00452	0.00332	0.00401	<0.000010
	Vanadium (V)-Total (mg/L)		0.0060	<0.0010	0.0033	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0118	0.684	0.517	0.812	<0.0030
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0029	0.0013	0.0022	0.0011	<0.0010
	Antimony (Sb)-Dissolved (mg/L)		0.00072	0.0115	0.00890	0.0130	<0.00010
	Arsenic (As)-Dissolved (mg/L)		0.00108	0.0164	0.0160	0.0817	<0.00010
	Barium (Ba)-Dissolved (mg/L)		0.0415	0.0115	0.0262	0.0170	<0.000050
	Beryllium (Be)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)		<0.010	<0.010	0.047	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)		<0.000010	0.00196	0.000499	0.000435	<0.000010
	Calcium (Ca)-Dissolved (mg/L)		108	182	242	185	<0.050
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	0.00048	0.00036	0.00109	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00069	<0.00020	0.00059	<0.00020	<0.00020
	Iron (Fe)-Dissolved (mg/L)		0.028	0.096	0.294	2.07	<0.010
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	0.000161	0.000077	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00055	0.00941	0.00842	0.00998	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)		30.2	62.7	115	64.9	<0.10

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L1392004-21 Water 14-NOV-13 16:15 0167-131114- TRAVEL BLANK				
Grouping	Analyte				
WATER					
Total Metals	Magnesium (Mg)-Total (mg/L)	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.000050			
	Mercury (Hg)-Total (mg/L)	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.000050			
	Nickel (Ni)-Total (mg/L)	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.050			
	Potassium (K)-Total (mg/L)	<0.10			
	Selenium (Se)-Total (mg/L)	<0.00010			
	Silicon (Si)-Total (mg/L)	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000010			
	Sodium (Na)-Total (mg/L)	<0.050			
	Strontium (Sr)-Total (mg/L)	<0.00020			
	Sulfur (S)-Total (mg/L)	<0.50			
	Thallium (Tl)-Total (mg/L)	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010			
	Titanium (Ti)-Total (mg/L)	<0.010			
	Uranium (U)-Total (mg/L)	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0030			
Dissolved Metals	Dissolved Mercury Filtration Location				
	Dissolved Metals Filtration Location				
	Aluminum (Al)-Dissolved (mg/L)				
	Antimony (Sb)-Dissolved (mg/L)				
	Arsenic (As)-Dissolved (mg/L)				
	Barium (Ba)-Dissolved (mg/L)				
	Beryllium (Be)-Dissolved (mg/L)				
	Bismuth (Bi)-Dissolved (mg/L)				
	Boron (B)-Dissolved (mg/L)				
	Cadmium (Cd)-Dissolved (mg/L)				
	Calcium (Ca)-Dissolved (mg/L)				
	Chromium (Cr)-Dissolved (mg/L)				
	Cobalt (Co)-Dissolved (mg/L)				
	Copper (Cu)-Dissolved (mg/L)				
	Iron (Fe)-Dissolved (mg/L)				
	Lead (Pb)-Dissolved (mg/L)				
	Lithium (Li)-Dissolved (mg/L)				
	Magnesium (Mg)-Dissolved (mg/L)				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1392004-1 Water 13-NOV-13 10:28 0167-131113-001	L1392004-2 Water 13-NOV-13 09:30 0167-131113-002	L1392004-3 Water 13-NOV-13 08:40 0167-131113-003	L1392004-4 Water 13-NOV-13 13:58 0167-131113-004	L1392004-5 Water 13-NOV-13 14:10 0167-131113-005	
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.0398	0.345	0.0619	0.0359	0.0353
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000360	0.000277	0.000342	0.000366	0.000356
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00180	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.69	0.88	0.70	0.62	0.62
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	6.31	8.78	6.50	6.27	6.27
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.90	2.34	2.92	2.60	2.59
	Strontium (Sr)-Dissolved (mg/L)	0.305	0.0760	0.282	0.309	0.308
	Sulfur (S)-Dissolved (mg/L)	8.39	1.49	7.68	6.02	6.10
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000607	0.000206	0.000567	0.000625	0.000596
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0020	0.0011	<0.0010	0.0014

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1392004-6	L1392004-7	L1392004-8	L1392004-9	L1392004-10
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13
		Sampled Time	11:40	11:40	15:40	18:40	17:05
		Client ID	0167-131113-006	0167-131113-007	0167-131113-010	0167-131113-018	0167-131113-011
Grouping	Analyte						
WATER							
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)		3.62	3.59	0.0272	0.0974	5.89
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.000587	0.000595	0.000363	0.000080	0.00103
	Nickel (Ni)-Dissolved (mg/L)		0.00159	0.00157	<0.00050	0.00063	0.00263
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		4.45	4.29	0.60	0.86	6.93
	Selenium (Se)-Dissolved (mg/L)		0.00015	0.00014	<0.00010	<0.00010	0.00022
	Silicon (Si)-Dissolved (mg/L)		7.01	7.01	6.26	6.55	7.17
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	0.000013
	Sodium (Na)-Dissolved (mg/L)		22.8	23.0	2.56	4.10	38.2
	Strontium (Sr)-Dissolved (mg/L)		0.572	0.565	0.309	0.466	0.865
	Sulfur (S)-Dissolved (mg/L)		160	162	5.78	38.5	274
	Thallium (Tl)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)		0.00182	0.00177	0.000612	0.000646	0.00371
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	0.0015
	Zinc (Zn)-Dissolved (mg/L)		0.0069	0.0067	<0.0010	0.192	0.0065

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1392004-11	L1392004-12	L1392004-13	L1392004-14	L1392004-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13	13-NOV-13
		Sampled Time	18:05	14:30	17:40	16:55	18:05
		Client ID	0167-131113-014	0167-131113-012	0167-131113-013	0167-131113-009	0167-131113-008
Grouping	Analyte						
WATER							
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.237	0.0348	0.750	4.78	0.313	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.000338	0.000371	0.00194	0.000872	0.000245	
	Nickel (Ni)-Dissolved (mg/L)	0.00075	<0.00050	0.00152	0.00193	0.00058	
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Dissolved (mg/L)	3.97	0.61	18.5	5.87	4.14	
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	
	Silicon (Si)-Dissolved (mg/L)	6.90	6.31	2.37	6.62	6.73	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000027	<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	7.23	2.59	22.8	31.2	7.75	
	Strontium (Sr)-Dissolved (mg/L)	0.492	0.318	0.740	0.792	0.586	
	Sulfur (S)-Dissolved (mg/L)	200	6.06	273	227	202	
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000221	<0.000010	<0.000010	
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.00230	0.000584	0.00132	0.00272	0.00262	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	0.0271	0.0014	0.124	0.0050	0.0326	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1392004-16 Water 14-NOV-13 10:50 0167-131114-016	L1392004-17 Water 14-NOV-13 10:20 0167-131114-021	L1392004-18 Water 14-NOV-13 09:28 0167-131114-015	L1392004-19 Water 14-NOV-13 10:12 0167-131114-019	L1392004-20 Water 13-NOV-13 20:00 0167-131113- FIELD BLANK	
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.134	1.04	1.03	1.27	<0.000050
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000359	0.000238	0.000323	<0.000050
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00145	0.00086	0.00163	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	4.90	3.75	5.18	3.76	<0.10
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	5.26	6.60	6.81	6.62	<0.050
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	4.95	5.16	7.90	4.98	<0.050
	Strontium (Sr)-Dissolved (mg/L)	0.316	0.435	0.653	0.445	<0.00020
	Sulfur (S)-Dissolved (mg/L)	82.6	137	239	142	<0.50
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000097	0.000017	0.000078	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000350	0.00430	0.00336	0.00394	<0.000010
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.657	0.312	0.781	<0.0010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
Grouping	Analyte				
WATER					
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)				
	Mercury (Hg)-Dissolved (mg/L)				
	Molybdenum (Mo)-Dissolved (mg/L)				
	Nickel (Ni)-Dissolved (mg/L)				
	Phosphorus (P)-Dissolved (mg/L)				
	Potassium (K)-Dissolved (mg/L)				
	Selenium (Se)-Dissolved (mg/L)				
	Silicon (Si)-Dissolved (mg/L)				
	Silver (Ag)-Dissolved (mg/L)				
	Sodium (Na)-Dissolved (mg/L)				
	Strontium (Sr)-Dissolved (mg/L)				
	Sulfur (S)-Dissolved (mg/L)				
	Thallium (Tl)-Dissolved (mg/L)				
	Tin (Sn)-Dissolved (mg/L)				
	Titanium (Ti)-Dissolved (mg/L)				
	Uranium (U)-Dissolved (mg/L)				
	Vanadium (V)-Dissolved (mg/L)				
	Zinc (Zn)-Dissolved (mg/L)				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Beryllium (Be)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Boron (B)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cobalt (Co)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cyanate	DLIS	L1392004-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cyanate	DLIS	L1392004-13, -14, -15, -16, -17, -18, -19, -20, -21
Matrix Spike	Sulfate (SO4)	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1392004-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLIS	Detection Limit Adjusted: Insufficient Sample
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
<p>This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.</p>			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-CL-IC-WR Water Chloride by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-F-IC-WR Water Fluoride by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-NO2-IC-WR Water Nitrite Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-NO3-IC-WR Water Nitrate Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-WR Water Sulphate by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

CN-CNO-WT Water Cyanate APHA 4500-CN-L

CN-SCN-VA Water Thiocyanate by Colour APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.

CN-T-CFA-VA Water Total Cyanide in water by CFA ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-VA Water Weak Acid Diss. Cyanide in water by CFA APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

EC-MAN-WR Water Conductivity by Meter APHA 2510 (B)

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using an electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Reference Information

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

PH-MAN-WR Water pH by Meter APHA 4500-H (B)

"This analysis is carried out using procedures adapted from APHA Method 4500-H ""pH Value"". The pH is determined in the laboratory using a pH electrode."

S-DIS-ICP-VA Water Dissolved Sulfur in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA Water Total Sulfur in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

TSS-MAN-WR Water Total Suspended Solids by Gravimetric APHA 2540 D

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Laboratory Definition Code	Laboratory Location
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1	2	3	4
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GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)	
Company: EDI		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Contact: Meghan Marjanovic		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			
Address: 2195 - 2nd Ave		Email 1: mmarjanovic@edynamics.com			
Y1A 3T8		Email 2:			
Phone: 867-393-4882		Email 3:			
Fax: 867-393-4882		Client / Project Information			
Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Job #: Mount Nansen 13-Y-0167			
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		PO / AFE:			
Company: Environmental Dynamics Inc		LSD:			
Contact: Shannon Jenner sjenner@edynamics.com		Quote #: Q38399			
Address: 2195 - 2nd Ave, Y1A 3T8		ALS Contact: Shevon			
Phone: 867-393-4882		Sampler: SM, DH, DS			
Fax: 867-393-4882		Date (dd-mm-yy)		Time (hh:mm)	
LabWorks Order # (labuse only) (This description will appear on the report)		Sample Identification		Sample Type	
Sample #					
1	0167-1311 13 - 010	13-Nov-13	15:40	Water	ALK-PCT-VA
2	0167-1311 13 - 018	13-Nov-13	18:40	Water	ANIONS-ALL-IC-WR
3	0167-1311 13 - 011	13-Nov-13	17:05	Water	CN-CNO-WT
4	0167-1311 13 - 014	13-Nov-13	18:05	Water	CN-SCN-VA
5	0167-1311 13 - 012	13-Nov-13	14:30	Water	CN-T-CFA-VA
6	0167-1311 13 - 013	13-Nov-13	17:40	Water	CN-WAD-CFA-VA
7	0167-1311 13 - 009	13-Nov-13	16:55	Water	EC-MAN-WR, PH-MAN-WR
8	0167-1311 13 - 008	13-Nov-13	18:05	Water	MET-D-BCMDG-A
9					MET-T-BCMDG-VA
10					NH3-F-VA
11					TDS-VA, TSS-VA
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Special Instructions

Barcode: L1392004COFC

water Aquatic Life/BC CSR - Commercial/IAB Tier 1 - Natural, etc) / Hazardous Details

in may delay analysis. Please fill in this form LEGIBLY.
 as with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

By the

Released by: *Shawn [Signature]* Date (dd-mm-yy) 14-Nov-13 Time (hh-mm) 7:24 Received by: _____ Date: _____ Time: _____ Temperature: _____ °C

SHIPMENT RELEASE (LAB USE ONLY) SHIPMENT RECEPTION (LAB USE ONLY) SHIPMENT VERIFICATION (LAB USE ONLY)

Observations: Yes / No ? If Yes add SIF

GENF 18.01 Front



ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195 - 2nd Ave
Whitehorse YT Y1A 3A2

Date Received: 14-NOV-13
Report Date: 22-NOV-13 12:38 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1392001
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1
Legal Site Desc:

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1392001-1 Water 14-NOV-13 08:45 0167-131114-025	L1392001-2 Water 14-NOV-13 08:35 0167-131114-024	L1392001-3 Water 14-NOV-13 08:30 0167-131114-023	L1392001-4 Water 14-NOV-13 09:00 0167-131114-026
Grouping	Analyte				
WATER					
Physical Tests	Colour, True (CU)				<5.0
	Conductivity (uS/cm)	1820	1650	2070	446
	Hardness (as CaCO3) (mg/L)	1200	1190	1620	196
	pH (pH)	7.97	7.91	7.36	7.79
	Total Suspended Solids (mg/L)	3.3	<3.0	4.7	
	Total Dissolved Solids (mg/L)	1560	1550	2180	201
	Turbidity (NTU)				0.25
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	179	172	191	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	
	Alkalinity, Total (as CaCO3) (mg/L)	179	172	191	163
	Ammonia, Total (as N) (mg/L)	<0.0050 ^{DLA}	<0.0050 ^{DLA}	0.0196 ^{DLA}	
	Chloride (Cl) (mg/L)	<5.0	<5.0	<10 ^{DLA}	<0.50
	Fluoride (F) (mg/L)	0.34 ^{DLA}	0.29 ^{DLA}	<0.40 ^{DLA}	0.108
	Nitrate (as N) (mg/L)	<0.050 ^{DLA}	<0.050 ^{DLA}	<0.10 ^{DLA}	0.143
	Nitrite (as N) (mg/L)	<0.010 ^{DLA}	<0.010 ^{DLA}	<0.020 ^{DLA}	<0.0010
	Sulfate (SO4) (mg/L)	1010	1010	1470	31.2
	Anion Sum (meq/L)	24.6	24.5	34.4	3.91
	Cation Sum (meq/L)	24.7	24.5	33.3	4.17
	Cation - Anion Balance (%)	0.2	0.0	-1.7	3.2
Total Metals	Aluminum (Al)-Total (mg/L)	0.0084	0.0082	0.0369	<0.010
	Antimony (Sb)-Total (mg/L)	0.00367	0.00358	0.00203	<0.00050
	Arsenic (As)-Total (mg/L)	0.0115	0.0114	0.0411	0.00048
	Barium (Ba)-Total (mg/L)	0.0119 ^{DLA}	0.0118 ^{DLA}	0.00861 ^{DLA}	0.084
	Beryllium (Be)-Total (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Bismuth (Bi)-Total (mg/L)	<0.0010 ^{DLA}	<0.0010 ^{DLA}	<0.0010 ^{DLA}	
	Boron (B)-Total (mg/L)	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.10
	Cadmium (Cd)-Total (mg/L)	0.00295	0.00292	0.00935	<0.00020
	Calcium (Ca)-Total (mg/L)	337 ^{DLA}	327 ^{DLA}	447 ^{DLA}	45.7
	Chromium (Cr)-Total (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.0020
	Cobalt (Co)-Total (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	0.00103	
	Copper (Cu)-Total (mg/L)	0.0036	0.0030	0.0046	<0.0010
	Iron (Fe)-Total (mg/L)	0.047	0.057	0.366	<0.030
	Lead (Pb)-Total (mg/L)	0.00072	0.00063	0.00272	0.00068
	Lithium (Li)-Total (mg/L)	0.0101	0.0095	0.0114	
	Magnesium (Mg)-Total (mg/L)	93.5	91.4	129	20.0
	Manganese (Mn)-Total (mg/L)	0.0705	0.0715	2.03	<0.0020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1392001-1 Water 14-NOV-13 08:45 0167-131114-025	L1392001-2 Water 14-NOV-13 08:35 0167-131114-024	L1392001-3 Water 14-NOV-13 08:30 0167-131114-023	L1392001-4 Water 14-NOV-13 09:00 0167-131114-026	
Grouping	Analyte				
WATER					
Total Metals	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.00020
	Molybdenum (Mo)-Total (mg/L)	0.00019	0.00017	0.00015	
	Nickel (Ni)-Total (mg/L)	<0.0010 ^{DLA}	<0.0010 ^{DLA}	0.0013	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)	4.13	3.86	5.25	0.87
	Selenium (Se)-Total (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.0010
	Silicon (Si)-Total (mg/L)	3.22	3.10	3.71	
	Silver (Ag)-Total (mg/L)	<0.000020 ^{DLA}	<0.000020 ^{DLA}	0.000049	
	Sodium (Na)-Total (mg/L)	13.5	13.0	16.1	5.1
	Strontium (Sr)-Total (mg/L)	1.10	1.07	1.26	
	Sulfur (S)-Total (mg/L)	345	335	482	
	Thallium (Tl)-Total (mg/L)	0.000065	0.000071	0.000139	
	Tin (Sn)-Total (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Titanium (Ti)-Total (mg/L)	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	
	Uranium (U)-Total (mg/L)	0.00425	0.00427	0.00407	0.00179
	Vanadium (V)-Total (mg/L)	<0.0020 ^{DLA}	<0.0020 ^{DLA}	<0.0020 ^{DLA}	
	Zinc (Zn)-Total (mg/L)	0.359	0.355	0.825	<0.050
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.0021	<0.0020 ^{DLA}	<0.0020 ^{DLA}	
	Antimony (Sb)-Dissolved (mg/L)	0.00362	0.00349	0.00154	
	Arsenic (As)-Dissolved (mg/L)	0.00929	0.00923	0.0141	
	Barium (Ba)-Dissolved (mg/L)	0.0117	0.0116	0.00773	
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 ^{DLA}	<0.0010 ^{DLA}	<0.0010 ^{DLA}	
	Boron (B)-Dissolved (mg/L)	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	
	Cadmium (Cd)-Dissolved (mg/L)	0.00291	0.00284	0.00893	
	Calcium (Ca)-Dissolved (mg/L)	331	324	443	
	Chromium (Cr)-Dissolved (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Cobalt (Co)-Dissolved (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	0.00089	
	Copper (Cu)-Dissolved (mg/L)	0.00245	0.00249	0.00220	
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	0.017	
	Lead (Pb)-Dissolved (mg/L)	<0.00010 ^{DLA}	<0.00010 ^{DLA}	<0.00010 ^{DLA}	
	Lithium (Li)-Dissolved (mg/L)	0.0095	0.0094	0.0106	
	Magnesium (Mg)-Dissolved (mg/L)	91.6	92.6	125	
	Manganese (Mn)-Dissolved (mg/L)	0.0668	0.0670	1.86	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1392001-1	L1392001-2	L1392001-3	L1392001-4	
Description	Water	Water	Water	Water	
Sampled Date	14-NOV-13	14-NOV-13	14-NOV-13	14-NOV-13	
Sampled Time	08:45	08:35	08:30	09:00	
Client ID	0167-131114-025	0167-131114-024	0167-131114-023	0167-131114-026	
Grouping	Analyte				
WATER					
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.00016	0.00016	<0.00010 ^{DLA}	
	Nickel (Ni)-Dissolved (mg/L)	<0.0010 ^{DLA}	<0.0010 ^{DLA}	0.0012	
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	
	Potassium (K)-Dissolved (mg/L)	3.77	3.83	4.92	
	Selenium (Se)-Dissolved (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Silicon (Si)-Dissolved (mg/L)	3.07	3.08	3.44	
	Silver (Ag)-Dissolved (mg/L)	<0.000020 ^{DLA}	<0.000020 ^{DLA}	<0.000020 ^{DLA}	
	Sodium (Na)-Dissolved (mg/L)	13.0	12.8	15.2	
	Strontium (Sr)-Dissolved (mg/L)	1.05	1.05	1.13	
	Sulfur (S)-Dissolved (mg/L)	324	323	450	
	Thallium (Tl)-Dissolved (mg/L)	0.000059	0.000059	0.000121	
	Tin (Sn)-Dissolved (mg/L)	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00020 ^{DLA}	
	Titanium (Ti)-Dissolved (mg/L)	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	
	Uranium (U)-Dissolved (mg/L)	0.00408	0.00409	0.00380	
	Vanadium (V)-Dissolved (mg/L)	<0.0020 ^{DLA}	<0.0020 ^{DLA}	<0.0020 ^{DLA}	
	Zinc (Zn)-Dissolved (mg/L)	0.350	0.346	0.788	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Beryllium (Be)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Boron (B)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Chromium (Cr)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Cobalt (Co)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Lead (Pb)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Nickel (Ni)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Selenium (Se)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Silver (Ag)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Tin (Sn)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Titanium (Ti)-Dissolved	DLA	L1392001-1, -2, -3
Duplicate	Vanadium (V)-Dissolved	DLA	L1392001-1, -2, -3
Matrix Spike	Sulfate (SO4)	MS-B	L1392001-1, -2, -3, -4
Matrix Spike	Sulfate (SO4)	MS-B	L1392001-1, -2, -3, -4
Matrix Spike	Sulfate (SO4)	MS-B	L1392001-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Manganese (Mn)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Uranium (U)-Total	MS-B	L1392001-1, -2, -3
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1392001-1, -2, -3
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1392001-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-MAN-WR	Water	Alkalinity by Manual Titration	APHA 2320
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-CL-IC-WR	Water	Chloride by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
ANIONS-F-IC-WR	Water	Fluoride by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.			
ANIONS-NO2-IC-WR	Water	Nitrite Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.			
ANIONS-NO3-IC-WR	Water	Nitrate Nitrogen by Ion Chromatography	EPA 300.1
This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision			

Reference Information

1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-WR Water Sulphate by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

COLOUR-TRUE-WR Water Colour (True) by Spectrometer APHA 2120

"This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Apparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit."

EC-MAN-WR Water Conductivity by Meter APHA 2510 (B)

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using an electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-CVAFS-VA Water Total Mercury in Water by CVAFS EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Reference Information

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
PH-MAN-WR	Water	pH by Meter	APHA 4500-H (B)
"This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode."			
S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.			
S-TOT-ICP-VA	Water	Total Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.			
TDS-CALC-VA	Water	TDS (Calculated)	APHA 1030E (20TH EDITION)
This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".			
TSS-MAN-WR	Water	Total Suspended Solids by Gravimetric	APHA 2540 D
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.			
TURBIDITY-WR	Water	Turbidity by Nephelometer	APHA 2130
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Reference Information

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



ENVIRONMENTAL DYNAMICS INC.
ATTN: Meghan Marjanovic
2195-2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 14-NOV-13
Report Date: 03-DEC-13 14:59 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1392012
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 13-Y-0167
C of C Numbers: 1
Legal Site Desc:

Comments: Please note ALS identified sample L1392012-1 was sublet to Nautilus Environmental for LT50 analysis.

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID					
Grouping	Analyte				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Nautilus Environmental

8664 Commerce Court, Burnaby, BC V5A 4N7

WO#: 13623

Mr. Can Dang
ALS Environmental
Suite 100-8081 Lougheed Hwy.
Burnaby, BC
V5A 1W9

December 2, 2013

Dear Mr. Dang:

Re: Toxicity testing on the sample identified as L1392012-1 (0167-131113-011) [Collected on November 13, 2013]

Nautilus Environmental is pleased to provide you the results of the 96-h LT50 rainbow trout toxicity test on the above sample, received on November 18, 2013. Testing was conducted according to Environment Canada Protocol 1/RM/13, (Second Edition, 2000, including May 2007 amendments). The result of this test is provided in the table below and is based on the appended data. All acceptability criteria outlined in the Environment Canada protocol were met.

Table A. Result for the 96-h rainbow trout test.

Sample ID	Collection Date and Time	96-h LT50 (hours) ¹
L1392012-1 (0167-131113-011)	November 13 2013 @ 1705	>96

¹ Results relate only to the sample tested.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

Nautilus Environmental

Verified by

Jacob Frank, B.Sc.
Laboratory Biologist

Julianna Kalocai, M.Sc., R.P.Bio.
QA Officer

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: November 18/13 @ 1130

Work Order No.: 13623

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: L1392012-1
Sample Date: November 13/13 @ 1705
Date Received: November 18/13 @ 1100
Sample Volume: 1 x 20L
Other: N/A

Test Validity Criteria:

≥ 90% control survival

WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L CaCO₃): 10
Alkalinity (mg/L CaCO₃): 6

Test Organism Information:

Batch No.: 102313
Source: Miracle Springs
No. Fish/Volume (L): 10/10
Loading Density: 0.37
Mean Length ± SD (mm): 34 ± 4 Range: 29 - 43
Mean Weight ± SD (g): 0.37 ± 0.20 Range: 0.21 - 0.88

NaNO₂ Reference Toxicant Results:

Reference Toxicant ID: RTNE49
Stock Solution ID: 13NE02
Date Initiated: November 6/13
96-h LC₅₀ (95% CL): 6.6 (5.8 - 7.5) mg/L NaNO₂

Reference Toxicant Mean and Historical Range: 5.4 (2.3 - 12.5) mg/L NaNO₂
Reference Toxicant CV (%): 52

Test Results: The 96-h LT50 is > 96-hours.

Reviewed by: J Cole

Date reviewed: Nov. 29/13

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
 Sample I.D. L1392012-1
 W.O. # 13623
 RBT Batch #: 102313
 Date Collected/Time: November 13/13 @ 1705
 Date Setup/Time: November 18/13 @ 1130
 Sample Setup By: DBF

D.O. meter: DO: 1/2
 pH meter: pH: 1/2
 Cond. Meter: C: 1/2

Number Fish/Volume: 10/10
 7-d % Mortality: 0.0
 Total Pre-aeration Time (mins): 30
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5	/	14.5
pH	6.9	/	7.1
D.O. (mg/L)	10.2	/	10.2
Cond. (µS/cm)	1803	/	1805

Concentration	# Survivors						Temperature (°C)						Dissolved Oxygen (mg/L)						pH						Conductivity (µS/cm)							
	1	2	4	24	48	72	96	0	24	48	72	96	10.0	9.5	9.0	8.5	0	24	48	72	96	0	24	48	72	96	0	96				
(% v/v)																																
cont	10	10	10	10	10	10	10	14.5	14.5	14.0	14.0	14.0	10.1	9.3	8.8	8.3	10.0	9.3	8.8	8.3	7.1	6.9	6.9	6.9	6.9	7.1	6.9	6.9	6.9	6.9	31	38
100	10	10	10	10	10	10	10	14.5	14.5	14.0	14.0	14.0	10.2	9.4	8.9	8.4	10.2	9.4	8.9	8.3	7.1	6.2	6.3	6.3	6.3	7.1	6.2	6.3	6.3	6.3	1805	1764
Initials	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	DBF	EMM	EMM

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Orange, turbid

Fish Description at 96 h all fish appear ok Number of Stressed Fish at 96 h 0

Other Observations: _____

Reviewed by: JGU Date Reviewed: Dec. 2/13



L1392012

VANCOUVER

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL
8664 COMMERCE COURT
BURNABY, BC V5A 4N7

WO # 13623

NOTES: Please reference on final report and invoice: PO# L1392012
ALS requires QC data to be provided with your final results.
RBTLT50

Please see enclosed 1 sample(s) in 1 Container(s)

Table with columns: SAMPLE NUMBER, CLIENT ID, ANALYTICAL REQUIRED, DATE SAMPLED, DUE DATE, Priority Flag. Row 1: L1392012-1, 0167-131113-011 LT50, Special Request- Nautilus Environmental (SPECIAL REQUEST-NL 14), 11/13/2013, 12/9/2013, w 1705h

Subcontract Info Contact: Dorota Jamro (604) 253-4188
Analysis and reporting info contact: Can Dang
8081 LOUGHEED HWY
SUITE 100
BURNABY, BC V5A 1W9
Phone: (604) 253-4188 Email: can.dang@alsglobal.com

Please email confirmation of receipt to: can.dang@alsglobal.com

Shipped By: [Signature] Date Shipped: Nov 18/2013
Received By: Date Received: NDU 18/13 @ 1100
Verified By: Date Verified:
Temperature: 12.3

Sample Integrity Issues:



Appendix C:
YG Bacteriological Results
November 12-14, 2013



**BACTERIOLOGICAL ANALYSIS OF DRINKING WATER
ANALYSE BACTÉRIOLOGIQUE DE L'EAU POTABLE**

Health and Social Services
Santé et Affaires Sociales
Environmental Health Services
Service d'hygiène du milieu

#2 Hospital Road, Whitehorse, Yukon Y1A 3H8
phone : (867) 667-8391 fax : (867) 667-8322
Toll free: 1-800-661-0408 ext.8391

2 Hospital Road, Whitehorse (Yukon) Y1A 3H8
Tél. : 867-667-8391 Téléc. : 867-667-8322
Sans frais au Yukon 1-800-661-0408, poste 8391

Contact Information • Coordonnées de la personne-ressource

Contact Person Megan Hergenovic Phone 867 393 4882
Personne-ressource Megan Hergenovic Telephone 867 393 4882
Mailing address 2195 Second Ave Fax 867 393 4883
Adresse postale Whitehorse YT Télécopieur 867 393 4883
Postal code Y1A 3T8 Code postal Y1A 3T8
First Nation, Municipal or Business Name Environnement Dynamis Inc (ÉDT)
Nom de la Première nation, de la municipalité ou de l'entreprise Environnement Dynamis Inc (ÉDT)
Agent _____ Télécopieur _____

Sampling Location • Lieu de la prise d'échantillon

Municipal Address Pump house 44 NANSER Subdivision Loisirs
Adresse municipale Pump house 44 NANSER Loisirs
Legal Description Lot _____ Quad _____ Plan no. _____
Description officielle Lot _____ Quadrilatère _____ Plan n° _____
Other Information (e.g., Location, Business / Building Name) _____
Autres renseignements (ex. : emplacement, nom de l'entreprise, nom de l'édifice) _____

Sample Collection / Prélèvement de l'échantillon

Sample Collected By SM/DS Date 13/11/14 Time 12:18 pm
Échantillon prélevé par SM/DS Date 13/11/14 Heure 12:18 pm
Sampling Site (e.g., Kitchen tap) WA-PW Previous Sample Number _____
Point d'échantillonnage (ex. : robinet de cuisine) WA-PW Numéro de l'échantillon précédent _____

Is this a Resample from a Previous Test? Yes No
Est-ce un deuxième échantillon d'un test antérieur? Oui Non

Sample Supply / Source d'approvisionnement en eau

Public Supply Bulk Water Distributor Business Private Residence
Municipal - par canalisation Municipal - par camion Privé - entreprise Privé - résidence

Sample Source / Provenance de l'échantillon

Dug Well Driven Well Drilled Well Depth of Well _____
Puits creusé Puits tubulaire Puits foré à la sondeuse Profondeur du puits _____
 Water Holding Tank Other (explain) _____
Réservoir d'eau Autre (précisez) _____

Water Treatment / Traitement de l'eau

Is the Water Chlorinated? Yes No Free Available Chlorine _____ p.p.m.
L'eau contient-elle du chlore? Oui Non Chlore libre disponible _____ mg/L

Other Treatment Systems (e.g., UV system, filter)
Autre dispositif de traitement (ex. : désinfection aux rayons UV, adoucisseur d'eau, filtre) _____

For Laboratory Use Only / À l'usage du laboratoire seulement

Receipt of Sample 13-11-14 Time 3:55 am By SS
Réception de l'échantillon 13-11-14 Heure 3:55 Par SS
YY/MM/DD - AA/MM/JJ YY/MM/DD - AA/MM/JJ
Condition of Sample Satisfactory Unsatisfactory Details 4.4°C
État de l'échantillon Satisfaisant Non satisfaisant Précisez 4.4°C
Incubation 13-11-14 Time 4:00 am By SS Incubator _____
YY/MM/DD - AA/MM/JJ Heure 4:00 Par SS Incubateur _____
Date 13-11-15 Time 4:10 am By SS Incubator _____
YY/MM/DD - AA/MM/JJ Heure 4:10 Par SS Incubateur _____

**Results (See Reverse Side for Interpretation)
Résultats (Voir au verso l'interprétation des résultats)**

Total Coliforms/Coliformes totaux

Present / Présence Absent / Absence

E. coli/E. coli

Present / Présence Absent / Absence

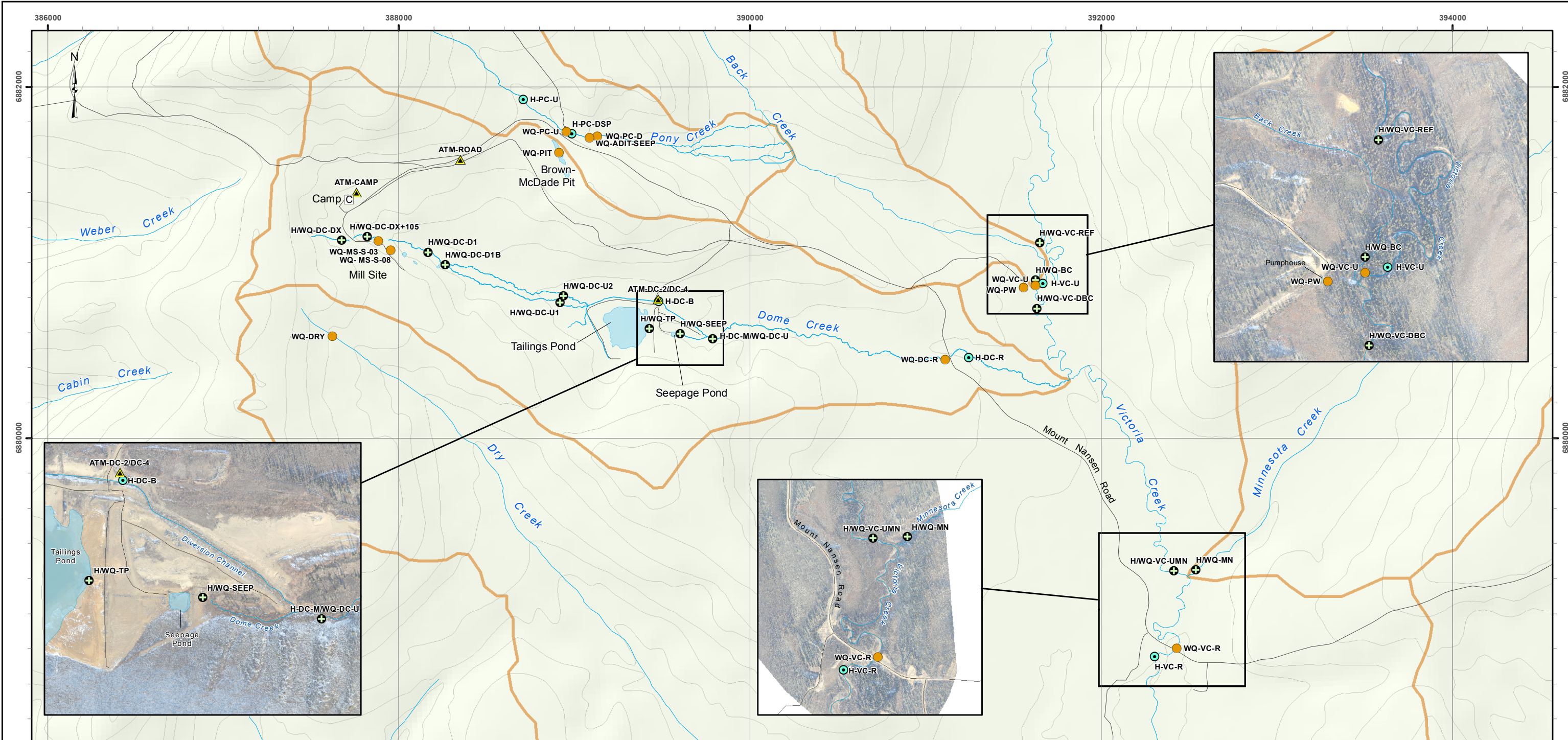
Comments / Commentaires

Report Authorized By SS/MS Position WLT Date 13-11-15
Rapport autorisé par SS/MS Poste WLT Date 13-11-15
YY/MM/DD - AA/MM/JJ YY/MM/DD - AA/MM/JJ

Distribution: White - Chain of Custody Yellow - Client Copy Pink - Lab Copy
Distribution: Blanc - Chaîne de possession Jaune - Client Rose - Laboratoire
Sample Number 55028
Numéro de l'échantillon 55028



Appendix D:
Map of Mount Nansen Site and Station Locations



Mount Nansen Site: Hydrometric Stations and Water Quality Sites

Legend

- Atmospheric Station (label ex: ATM-DC-2)
- Hydrometric Station and Water Quality Site (label ex: H/WQ-VC-UMN)
- Hydrometric Station (label ex: H-VC-R)
- Water Quality Site (label ex: WQ-PC-U)
- Unpaved Road/Access
- Drainage Areas (Local)

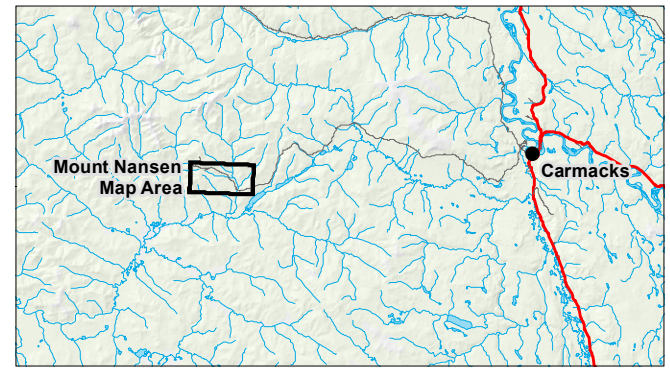
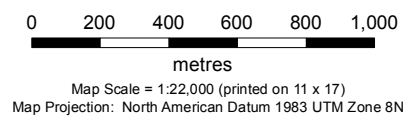
1:50,000 and 1:250,000 Topographic Spatial Data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Digital Elevation Model provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Watercourse, drainage areas and Mount Nansen Road layers digitized / modified by EDI (2011) using orthophotos provided by Yukon Government, Energy, Mines and Resources (2011).

Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. (2011) was obtained using Garmin GPS technology.

This document is not an official land survey and the spatial data presented is subject to change.



Drawn: LG	Checked: MM	FIGURE 1	Date: 28/10/2013
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